MODESTO SONG SPARROW *(Melospiza melodia mailliardi)*

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Criteria Scores

Population Trend	Range Trend	Population Size	Range Size	Endemism	Population Concentration	Threats
5	0	5	10	10	0	10

Special Concern Priority

Currently considered a Bird Species of Special Concern (year-round), Priority 3. No subspecies were included on the original list (Remsen 1978), and this subspecies was not included on CDFG's (1992) list.

Breeding Bird Survey Statistics for California

Data inadequate for trend assessment at the subspecies level (Sauer et al. 2000).

General Range and Abundance

The Modesto song sparrow is endemic to California, residing only in the north-central portion of the Central Valley (Grinnell and Miller 1944, AOU 1957). Highest densities occur in the Butte Sink area of the Sacramento Valley and in the Sacramento-San Joaquin River Delta (PRBO unpubl. data).

Seasonal Status in California

Occurs year round; breeding season extends from late March to early August.

Historical Range and Abundance in California

Grinnell and Miller (1944) described the Modesto song sparrow as a "common" resident occurring primarily below 200 ft (61 m) elevation in the Central Valley from Colusa County in the Sacramento Valley south through the Delta (exclusive of Suisun Marsh) to the northern San Joaquin Valley of Stanislaus County. No quantitative estimates of historic abundance exist. Within its historic range this subspecies was probably closely tied to the distribution of suitable freshwater wetlands and early successional riparian thickets.

Historic locations of confirmed breeding include Butte Creek, Butte, Colusa, and Sutter counties; Colusa, Colusa County; Sacramento, Sacramento County; Stockton, San Joaquin County; and the confluence of the San Joaquin and Tuolumne rivers, Stanislaus County (Grinnell and Miller 1944; WFVZ, CAS, & MVZ egg set data). Grinnell and Miller (1944) may have exaggerated the eastern limit of the range in the Sierra Nevada foothills, as they presented no records for that region and stated that birds above 200 ft (61 m) may not be the Modesto form. The former status of song sparrows west of the Sacramento River in Colusa County also is unclear, as few permanent wetlands may have occurred there historically (J. Silveira pers. comm.), and, again, Grinnell and Miller (1944) presented no re cords for that region. However, almost annual flooding of the Sacramento Valley's rivers created a shifting mosaic of habitats, including early successional stages of riparian forests, oxbow lakes, and seasonal to permanent wetlands, to which this song sparrow was probably well adapted.

Recent Range and Abundance in California

The general outline of the breeding range today remains largely unchanged. Despite limited historic data, it seems likely the over 90% loss of wetlands and riparian forests in the Central Valley (Thompson 1961, Frayer et al. 1989) greatly reduced overall numbers and extirpated the subspecies locally within its range.

The Modesto song sparrow remains locally numerous in areas where, by today's standards, extensive wetlands remain. Hence, the Delta and Butte Sink areas represent current centers of abundance for the subspecies (PRBO unpubl. data, T. Gardali pers. obs). In the northern portion of its range, song sparrows occur in low densities at Delevan and Colusa NWRs and are absent as breeders from the Sacramento NWR (PRBO unpubl. data). Immediately adjacent to the Butte Sink, song sparrows breed in sparsely vegetated irrigation canals, yet are almost entirely absent from the mainstem and tributaries of the Sacramento River above Sacramento. In addition to sites mentioned above, extensive summer surveys north of Sacramento during 1998 to 2000 located song sparrows

at Perkins and Eddy lakes, Butte County; the northernmost limit of Little Butte Creek, Butte County; and along the Sacramento River, Colusa and Sutter counties, west of Tisdale, Sutter County (PRBO unpubl. data). Singing song sparrows also occur in roadside irrigation ditches east of the Sacramento River above the Tisdale Bypass, Sutter County (T. Manolis in litt.), and within Sutter NWR (D. Gilmer in litt.).

Song sparrows also are numerous in the Delta, particularly in southwestern Sacramento County (T. Manolis in. litt.) and northwestern San Joaquin County (PRBO unpubl. data). Unlike in the Butte Sink, song sparrows in the Delta and northern San Joaquin Valley are locally numerous along riparian corridors, such as the Cosumnes, Mokeumne, and Stanislaus rivers (DiGaudio and Geupel 1998, PRBO unpubl. data), and sparse along vegetated irrigation canals and levees (T. Gardali pers. obs.).

Ecological Requirements

The ecological requirements of the Modesto song sparrow are largely undescribed. Grinnell and Miller (1994) noted the subspecies' affinity for emergent freshwater marshes dominated by tules (*Scirpus* spp.) and cattails (*Typha* spp.) as well as riparian willow (*Salix* spp.) thickets. These song sparrows also nest in riparian forests of valley oak (*Quercus lobata*) with a sufficient understory of blackberry (*Rubus* spp.), along vegetated irrigation canals and levees, and in recently planted valley oak restoration sites (DiGaudio and Geupel 1998, PRBO unpubl. data).

Marshall (1948) described the primary habitat requirements of several subspecies of song sparrow in California as being moderately dense vegetation to supply cover for nest sites, a source of standing or running water, semi-open canopies to allow light, and exposed ground or leaf litter for foraging. Song sparrows forage primarily on the ground, but foraging behavior is highly opportunistic (reviewed in Shuford 1993), perhaps reflecting changes in resource availability and distribution. The year-round diet of the song sparrow in California is roughly 79% vegetable and 21% animal matter, the latter taken mostly in May (Beal 1910). Nests usually are placed below 1 m

in a wide variety of plant species. Pairs will raise two, and perhaps three broods, and will re-nest following nest failure (DiGaudio and Geupel 1998, PRBO unpubl. data).

Studies of population limiting factors of the Modesto song sparrow are lacking. Low reproductive success along the Cosumnes River, however, potentially may be limiting that population (DiGaudio and Geupel 1998). The Modesto song sparrow may be sensitive to factors identified in studies of other subspecies of song sparrows. In a wetland-breeding population in coastal British Columbia, for example, high levels of nest predation coupled with brown-headed cowbird (*Molothrus ater*) parasitism reduced the birth rate below that needed to offset adult mortality (i.e., a population "sink"; Rodgers et al. 1997). Indeed, nest predation, and, to a lesser extent, cowbird parasitism were the primary factors responsible for nest failure at Cosumnes (DiGaudio and Geupel 1988). The inability to disperse may be limiting this subspecies in some parts of its range. Habitats such as those along the Sacramento River have few breeding song sparrows, yet this subspecies is abundant at the Butte Sink roughly 10 km away (PRBO unpubl. data). Elsewhere, however, this subspecies rapidly colonized a wastewater treatment wetland in Sacramento County two years after its construction (Jones et al. 1998).

Threats

Habitat loss, fragmentation, and degradation may be the primary threats to the Modesto song sparrow. Reproductive failure caused by inflated levels of nest predation is likely a threat to this subspecies. Habitat conversion may benefit both native and non-native nest predators. Potential predators at Cosumnes include feral domestic cats (*Felis domestica*), raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), opossums (*Didelphis marsupialis*), Norway rats (*Rattus norvegicus*), Western Scrub-jays (*Aphelocoma californica*), and American Crows (*Corvus brachyrhynchos*; DiGaudio and Geupel 1998). Cowbird parasitism, often cited as reducing reproductive success, may have only minimal affects. Song sparrows can tolerate mild levels of

parasitism because early broods can fledge before cowbirds begin reproduction and adults can rear cowbirds successfully with their own young (Nice 1937, PRBO unpubl. data).

Management and Research Recommendations

- protect and create suitable wetlands and early successional riparian areas.
- focus management and restoration efforts primarily on identifying and maintaining source populations capable of producing young in excess of adult mortality.
- conduct research to identify specific habitat requirements and ecological conditions that support self-sustaining populations; in particular, compare demographic rates in various habitat types, such as seasonal versus permanent wetland.
- gather data to see if limited dispersal capabilities explain the patchy distribution and low densities of this song sparrow away from the Butte Sink and whether establishing dispersal corridors would effectively increase its population.
- initiate studies on the ecology of nest predators within various habitat types to make clear the most effective management options for increasing reproductive output.

Monitoring Needs

The Breeding Bird Survey is inadequate for monitoring changes in the population dynamics of this subspecies. Survey routes are along roadways, whereas most Modesto song sparrows occur in wetlands away from roads and in refuges and preserves. The song sparrow, however, is well sampled by various other methods, such as off-road point counts and constant effort mist-netting (Ralph et al. 1993). The latter accurately estimates annual breeding productivity and adult survival for song sparrows in coastal California (Nur et al. 2000).

Annual monitoring should include estimation of an index of breeding population size via standardized point counts and of annual adult survival and breeding productivity via constant effort mist-netting (e.g., the MAPS program; DeSante 1992, DeSante et al. 1993).

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